

# United States Patent [19]

Loomis et al.

[11] Patent Number: 4,981,696

[45] Date of Patent: Jan. 1, 1991

[54] POLYLACTIDE COMPOSITIONS

[75] Inventors: Gary L. Loomis, Drexel Hill, Pa.; Joseph R. Murdoch, Wilmington, Del.

[73] Assignee: E. I. Du Pont de Nemours and Company, Wilmington, Del.

[21] Appl. No.: 438,123

[22] Filed: Nov. 20, 1989

Related U.S. Application Data

[60] Division of Ser. No. 256,471, Oct. 12, 1988, Pat. No. 4,902,515, which is a continuation-in-part of Ser. No. 187,350, Apr. 28, 1988, Pat. No. 4,800,219, which is a division of Ser. No. 108,531, Oct. 15, 1987, Pat. No. 4,766,182, which is a division of Ser. No. 944,588, Dec. 22, 1986, Pat. No. 4,719,246.

[51] Int. Cl.<sup>5</sup> A61K 9/14; A61K 13/00

[52] U.S. Cl. 424/486; 424/78; 424/423; 424/425; 424/426

[58] Field of Search 424/78, 423, 425, 426, 424/486

[56] References Cited

U.S. PATENT DOCUMENTS

3,636,956	1/1972	Schneider	128/335.5
3,773,919	11/1973	Boswell et al.	424/19
3,797,499	3/1974	Schneider	128/334
3,978,203	8/1976	Wise	.
4,279,249	7/1981	Vert et al.	128/92
4,419,340	12/1983	Yolles	424/19
4,471,077	9/1984	Lange	521/64
4,481,353	11/1984	Nyilas et al.	.
4,675,189	6/1987	Kent et al.	.
4,719,246	1/1988	Murdoch et al.	521/134
4,766,182	8/1988	Murdoch et al.	521/134

4,767,628 8/1988 Hutchinson .  
4,800,219 1/1989 Murdoch et al. .... 525/413  
4,902,515 2/1990 Loomis ..... 424/424

FOREIGN PATENT DOCUMENTS

275961 7/1988 European Pat. Off. .  
61-36321 2/1986 Japan .

OTHER PUBLICATIONS

Wise et al., J. Pharm. Pharmac. 30, 686 (1978).  
Gilding et al., Polymer 20, 1459 (1979).  
Goodman et al., Polymer Letters 5, 515 (1967).  
Fieser et al., "Organic Chemistry", 3rd Ed., Reinhold 1956, 267-269.  
Sakakihara et al., Macromolecules 2, (5), 515 (1969).  
Wise et al., "Drug Carriers in Biology and Medicine", Ed. G. Gregoriadis; Acad. Press, N.Y., 237-270 (1979).  
Kalb et al., Polymer 21, 607 (1980).  
Hatada et al., Polymer J., 13(8), 811 (1981).  
Matsubayashi et al., Macromolecules 10, 996 (1977).  
Dumas et al., Die Makromol. Chem., 156, 55 (1972).  
Sanders et al., J. of Pharm. Sci., 73(9) (1984).  
Lavellee et al., Proc. Int. Symp. on Adv. in Polymer Syn., Aug. 26-31, 1984, Plenum 1985, pp. 441-461.  
Grenier et al., J. Poly. Sci. Poly. Phys. Ed., 22, 577 (1984); ibid 19, 1781 (1981), Macromolecules, 16, 302 (1983).

Primary Examiner—Morton Foelak

Attorney, Agent, or Firm—Samuel S. Blight

[57]

ABSTRACT

Systems for delivery of biologically active materials employing novel polylactide composition containing segments of poly(R-lactide) interlocked with segments of poly(S-lactide) as the carrier.

9 Claims, No Drawings